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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,597	04/13/2006	Thierry Aubert	FR-AM 1982 NP	1566
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ARKEMA INC. PATENT DEPARTMENT - 26TH FLOOR 2000 MARKET STREET PHILADELPHIA, PA 19103-3222				
EXAMINER				
BOYLE, ROBERT C				
ART UNIT		PAPER NUMBER		
1764				
NOTIFICATION DATE		DELIVERY MODE		
04/05/2011		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/575,597

**Applicant(s)**

AUBERT, THIERRY

**Examiner**

ROBERT C. BOYLE

**Art Unit**

1764

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 February 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 8-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-912)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

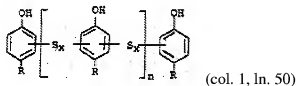
## DETAILED ACTION

### Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. The new grounds of rejection set forth below are necessitated by applicant's amendment filed on 2/10/2011. In particular, claim 1 has been amended to include the limitations of claims 4, 6, and 7. This presents the claims in a manner with a scope not previously examined. Thus, the following action is properly made FINAL.

### Claim Rejections - 35 USC § 103

3. Claims 1, 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ecsedy** (US 3,968,062) in view of **Rowland** (US 5,326,828).
4. As to claim 1, Ecsedy teaches using a polymeric para-tert butyl phenol disulfide as a curing agent (abstract) in the presence of a co-vulcanizing agent (col. 4, ln. 6-13) with an example having 1.08 of the disulfide and 0.75 of the co-agent (col. 6, ln. 58-59) which falls within the claimed amounts. Ecsedy teaches the general formula:



5. Where R can be a tert alkyl group, x, can be 1, 2 or a higher number, and n can be 0, 1, 2 or a higher digit (col. 1, ln. 55-65). Ecsedy teaches that a disulfide refers to when x is 2 (col. 1, ln. 66-67). Ecsedy discloses disulfides with 27% sulfur (col. 3, ln. 63-64). A disulfide with R as

t-butyl and with a p of 5 give 26.7% sulfur and disulfides with a p of 6 give 27.1% sulfur.

Therefore, the disulfides used by Ecsedy had an average p value of about 5.

6. Ecsedy does not teach using a urea.

7. Rowland teaches using urea with a disulfide system to cure elastomers (abstract) and that additional cure components may be helpful (col. 4, ln. 34-37). It would have been obvious to one of ordinary skill to use the curative system containing the ureas of Rowland because Rowland teaches a sulfide curative system that increases cure rate and reduces the amount of accelerator and minimize the presence of nitrosamine byproducts (abstract; col. 2, ln. 14-19).

8. As to claim 8, Ecsedy teaches using an effective quantity of the aryl disulfides and a urea co-agent to vulcanize polymers (column 1, lines 7-9, 40-55, column 4, lines 6-13; column 6, lines 5-25). Ecsedy also teaches vulcanization of copolymers of butadiene and other polymerizable olefins (column 1, lines 18-35). Coran teaches using urea coactivators (abstract) such as 1,3-dimethylurea and 1,3-diethylurea (col. 3, ln. 10-68) in the vulcanization of EPDM polymers (col. 2, ln. 15-31).

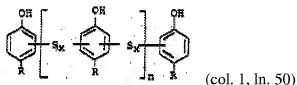
9. Claim 8 states a property of the vulcanization agent disclosed in claim 1: presenting no risk relative to formation of nitrosamines. Ecsedy and Coran do not elaborate on this property. However, since the same vulcanization agent that is disclosed in claim 1 is taught in Ecsedy and Rowland, one of ordinary skill in the art would expect that the vulcanization agent of Ecsedy and Rowland would have the same properties as the vulcanization agent disclosed in claim 1.

10. As to claim 9, Rowland teaches ethylene-propylene-diene rubber (col. 3, ln. 68).

11. As to claims 10-11, Ecsedy teaches 2 parts by weight agent: 0.25 TMTMS, 0.5 disulfide, and 1.25 MBTS, per 100 parts by weight elastomer: 65 enjay butyl, 25 natural rubber, and 20 whole tire reclaim (column 6, lines 5-25).

12. Claims 1, 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ecsedy** (US 3,968,062) in view of **Coran** (US 5,096,978).

13. As to claim 1, Ecsedy teaches using a polymeric para-tert butyl phenol disulfide as a curing agent (abstract) in the presence of a co-vulcanizing agent (col. 4, ln. 6-13) with an example having 1.08 of the disulfide and 0.75 of the co-agent (col. 6, ln. 58-59) which falls within the claimed amounts. Ecsedy teaches the general formula:



14. Where R can be a tert alkyl group, x, can be 1, 2 or a higher number, and n can be 0, 1, 2 or a higher digit (col. 1, ln. 55-65). Ecsedy teaches that a disulfide refers to when x is 2 (col. 1, ln. 66-67). Ecsedy discloses disulfides with 27% sulfur (col. 3, ln. 63-64). A disulfide with R as t-butyl and with a p of 5 give 26.7% sulfur and disulfides with a p of 6 give 27.1% sulfur. Therefore, the disulfides used by Ecsedy had an average p value of about 5.

15. Ecsedy does not teach using a urea.

16. Coran teaches using urea coactivators (abstract) such as 1,3-dimethylurea and 1,3-diethylurea (col. 3, ln. 10-68) in the vulcanization of EPDM polymers (col. 2, ln. 15-31). It would have been obvious to use the coactivators of Coran with the polysulfides of Ecsedy

because the use of urea coactivators results in improved cure rates with very little increase in scorch rate and modulus (col. 1, ln. 31-50).

17. As to claim 8, Ecsedy teaches using an effective quantity of the aryl disulfides and a urea co-agent to vulcanize polymers (column 1, lines 7-9, 40-55, column 4, lines 6-13; column 6, lines 5-25). Ecsedy also teaches vulcanization of copolymers of butadiene and other polymerizable olefins (column 1, lines 18-35). Coran teaches using urea coactivators (abstract) such as 1,3-dimethylurea and 1,3-diethylurea (col. 3, ln. 10-68) in the vulcanization of EPDM polymers (col. 2, ln. 15-31).

18. Claim 8 states a property of the vulcanization agent disclosed in claim 1: presenting no risk relative to formation of nitrosamines. Ecsedy and Coran do not elaborate on this property. However, since the same vulcanization agent that is disclosed in claim 1 is taught in Ecsedy and Coran, one of ordinary skill in the art would expect that the vulcanization agent of Ecsedy and Coran would have the same properties as the vulcanization agent disclosed in claim 1.

19. As to claim 9, Coran teaches rubber copolymers of ethylene, propylene and diene monomers (col. 2, ln. 11-14).

20. As to claims 10-11, Ecsedy teaches 2 parts by weight agent: 0.25 TMTMS, 0.5 disulfide, and 1.25 MBTS, per 100 parts by weight elastomer: 65 enjay butyl, 25 natural rubber, and 20 whole tire reclaim (column 6, lines 5-25).

### **Response to Arguments**

21. Applicant's arguments filed 2/10/2011 have been fully considered and are persuasive in part.

***Ecsedy '062 alone***

22. Applicant's arguments regarding the obviousness rejection over Ecsedy '062 alone are persuasive in that nothing in Ecsedy '062 does not provide motivation or suggestion to replace the sulfur in the thioureas with oxygen, or that sulfur is equivalent and interchangeable with oxygen. Therefore, the obviousness rejection over Ecsedy '062 alone is withdrawn. However, Ecsedy '062 continues to be relevant prior art and is not precluded from use in other rejections.

***Ecsedy in view of Rowland***

23. Applicant's arguments regarding Ecsedy '062 in view of Rowland '828 are not persuasive.

24. Applicant argues that each of the three components of Rowland are critical and replacing the TMTDS of Rowland with the disulfide of Ecsedy would be improper in view of the critical teaching. However, the combination of Ecsedy and Rowland does not require a substitution of TMTDS and disulfide as assumed by the Applicant. Rather, the rejection has allows for the addition of the curative system, which includes all the critical components of Rowland, including the claimed urea. Note that Rowland teaches that the TMTDS may be used as either primary or secondary accelerators (col. 2, ln. 11-14) and that additional cure components may be helpful (col. 4, ln. 34-37), thus allowing for the presence of a primary accelerator, such as the disulfides of Ecsedy.

25. Furthermore, the instant claim language uses the transitional phrase "comprising". Thus, the critical components taught in Rowland are not excluded from the claimed invention and can be combined with Ecsedy.

**Ecsedy in view of Coran**

26. It is noted that all claim limitations present in the amended claim 1 and dependent claims have been rejected by Ecsedy in view of Coran in the previous Office Action, ¶ 7-14.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ROBERT C. BOYLE** whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Thursday, 9:00AM-5:00PM Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert C. Boyle/  
Examiner, Art Unit 1764

/Vasu Jagannathan/  
Supervisory Patent Examiner, Art Unit 1764